Information Bulletin

Heavy Equipment Incidents at the Hanford Site

October 1, 2007 **2007-RL-HNF-0037** **Tracking No: 618**

Summary: A series of low-speed, non-injury events involving various types of heavy equipment have occurred at the Hanford site over the last year. While none of these incidents caused injury to Hanford workers it should be known that incidents like these can lead to serious injury or even death. This was the case in Arlington Heights, Illinois on August 8th, 2007 when an excavating truck accidentally knocked an energized power line into a trench killing a 32 year old worker and injuring another (Construction worker electrocuted in accident).

Discussion of Activities: Six incidents, involving heavy equipment used by multiple Hanford Contractors, occurred between July 2006 and March 2007. The incidents include: A track hoe that got stuck while attempting to cross a ditch; A forklift that collided with a government vehicle in a facility laydown area; A backhoe that backed into and broke off a light pole in a parking lot; A backhoe that backed into the front end of a van containing two employees; A parking lot sweeper that contacted and broke off a light pole in a parking lot; A heavy-duty four-wheel-drive weed-sprayer truck with 900 gallons of herbicide that sank sideways into the side of a slope causing the vehicle to nearly tip over.

Analysis: Although the activities performed are covered by Automated Job Hazards Analyses (AJHA), heavy equipment operation is considered an expert-based activity. Therefore, formal planning was not required for any of the specific accident-related activities in these incidents.

Review of the incidents provided indications of several common factors.

- Performance of simultaneous, multiple tasks - personnel were focusing on the performance of specific equipment maneuvers and lost situational awareness of their total operating environment [not continuously aware of their surroundings].

- Complacency - the collisions with light poles and running into vehicles in open spaces were not perceived as potential hazards prior to the events and 360° walk-arounds were not performed after changing conditions or the operator did not consider the entire operating environment when performing the walk-arounds.

- Making assumptions based upon apparent similar situations and past experiences - operations of the equipment off-road was assumed as routine activity but in reality many if the events had unusual operating conditions that were not recognized.

In each case, operations were occurring in error-likely settings without considering all of the potential hazards pertinent to the specific work location before the operations began. Pre-job briefs could have anticipated some work conditions, for example those encountered by the equipment operators before the forklift and backhoe multiple vehicle accidents. In those

events, vehicle entry into the work area could have been anticipated and a pre-job could have covered access control using common barriers or additional spotters. For other events where changes could not be foreseen, discussion at the time of the specific activity between the operator and supervisor or between operators, about the potential hazards that could be encountered performing the specific activities, could have surfaced the hazards and covered appropriate ways to have prevented the events.

The Automated Job Hazard Analysis (AJHA) for the vehicles in these events covered equipment and personnel related hazards but were not intended to address hazards associated with the specific event locations. This indicated a need to update the existing AJHA tool to cover more potential hazards specifically associated with heavy equipment operations.

Recommended Actions:

The following recommendations are derived from the HPI causal analysis conducted for this event. Workers and managers involved with the use and operation of heavy equipment should consider the following:

- Maintain an accurate perception of risk by being acutely aware of what is going on in your surroundings
- Be aware of complacency/overconfidence that no unexpected hazards exist
- Past knowledge or assumptions are not always reliable or accurate to the current job
- Be specific with self-checking practices to have a particular focus on the immediate task
- Employ peer checking; discuss job with other operators, spotters, and supervisors (one-on-one or in a group setting)
- Have a questioning attitude; question if critical evolutions can be safety performed
- Anticipate hazards and error likely situations early in planning and pre-job briefings

Work Function: Operations - Heavy Equipment

Hazards: Other

ISM Core Functions: Analyze Hazards, Develop/Implement Controls

Keywords: Heavy Equipment Operations, Conduct of Operations

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References: EM-RL--PHMC-FSS-2007-0004, EM-RL--PHMC-FSS-2006-0017, EM-RL--PHMC-FSS-2006-0010, EM-RP--CHG-ANALLAB-2006-0003, EM-RL--PHMC-FSS-2007-0005